IN THE CLAIMS

Claim 1. (Amended) A protection switching arrangement for optical switching systems comprising:

a plurality of optical switching matrices having multiple inputs and multiple outputs and being operable to switch optical channel signals from any one of a plurality of the inputs to any one of the plurality of the outputs;

a plurality of wavelength division demultiplexers coupled at its outputs to the inputs of the plurality of optical switching matrices for dividing a composite optical signal into optical channel signals and providing each optical channel signal to a corresponding optical switching matrix;

a spare wavelength division demultiplexer coupled at its outputs to the inputs of the plurality of optical switching matrices for dividing a composite optical signal into optical channel signals; and

at least one optical protection switch having a plurality of inputs and a plurality of straight-through outputs and at least one protection output and coupled at each of its straight-through outputs to an input of a respective one of the plurality of wavelength division demultiplexers and coupled at its protection output to an input of the spare wavelength division de-multiplexer.

Claim 2. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical protection switch is a 1xN MEMS switch where the switch matrices have N inputs.

Claim 3. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical protection switch is a 2xN MEMS switch where the switch matrices have N inputs, and one column of mirrors in the MEMS is used for protection switching.

Claim 4. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical protection switch is a 2xN MEMS switch where the switch matrices have N inputs, and one column of mirrors in the MEMS is used for testing.

Claim 5. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical protection switch is a 3xN MEMS switch where the switch matrices have N inputs.

Claim 6. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical protection switch is a 3xN MEMS switch where the switch matrices have N inputs, and one column of mirrors in the MEMS is used for protection switching.

Claim 7. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical protection switch is a 3xN MEMS switch where the switch matrices have N inputs, and one column of mirrors in the MEMS is used for testing.

Claim 8. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical protection switch is a 3xN MEMS switch where the switch matrices have N inputs, and either of two columns of mirrors in the MEMS is used for protection switching.

Claim 9. (Original) A protection switching arrangement as claimed in claim 1 wherein the optical channels are lambdas.

Claim 10. (Original) A protection switching arrangement as claimed in claim 1 further comprising a plurality of optical protection switches corresponding to the plurality of wavelength division demultiplexers, each optical protection switch coupled at its outputs to the inputs of the plurality of optical switching matrices and coupled at its inputs to the outputs of the corresponding wavelength division de-multiplexers.

Claim 11. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical protection switches are 1xM MEMS switches where there are M switch matrices.

Claim 12. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical protection switches are 2xM MEMS switches where there are M switch matrices, and one column of mirrors in the MEMS is used for protection switching.

Claim 13. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical protection switches are 2xM MEMS switches where there are M switch matrices, and one column of mirrors in the MEMS is used for testing the switching matrices.

Claim 14. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical protection switches are 3xM MEMS switches where there are M switch matrices.

Claim 15. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical protection switches are 3xM MEMS switches where there are M switch matrices, and one column of mirrors in the MEMS is used for protection switching.

Claim 16. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical protection switches are 3xM MEMS switches where there are M switch matrices, and one column of mirrors in the MEMS is used for testing the switching matrices.

Claim 17. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical protection switches are 3xM MEMS switches where there are M switch matrices, and either of two columns of mirrors in the MEMS is used for protection switching.

Claim 18. (Original) A protection switching arrangement as claimed in claim 10 wherein the optical channels are lambdas.

Claim 19. (Previously Presented) A protection switching arrangement comprising:

a first logical layer for switching optical channels;

a second logical layer for switching a group of optical channels; and

a first coupler for grouping together optical channels of the first logical layer and coupling them to the second logical layer;

a second coupler for ungrouping grouped optical channels of the second logical layer and coupling them to the first logical layer; and

a first protection switch providing an alternative switch path for at least one of the grouped optical channels from the first logical layer in the second logical layer.

Claim 20. (Previously Presented) A protection arrangement as claimed in claim 19 further comprising a second protection switch providing an alternative switch path for at least one of the optical channels from the second logical layer in the first logical layer.

Claim 21. (Original) A protection switching arrangement for optical switching systems comprising an optical protection switch including:

a first column of deployable mirrors, each mirror operable for deflecting an optical signal from an optical signal input path to a protection path; and

a second column of deployable mirrors, each mirror operable for deflecting an optical test signal from an optical test signal input path to an optical switch testing path;

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wherein for each mirror of the first column and corresponding mirror of the second column, the respective optical signal input path and optical switch test path are substantially aligned.

Claim 22. (Original) A protection arrangement as claimed in claim 21 wherein the first and second columns of mirrors are formed as faces of a deployable prison.

Claim 23. (Original) A protection switching arrangement for optical switching systems comprising an optical protection switch including:

a first column of deployable mirrors, each mirror operable for deflecting an optical signal from an optical signal input path to a protection path;

a second column of deployable mirrors, each mirror operable for deflecting an optical test signal from an optical test signal input path to an optical switch testing path; and

a third column of deployable mirrors, each mirror operable for deflecting an optical signal from an optical signal input path to a protection path;

wherein for each mirror of the first and third column and corresponding mirror of the second column, the respective optical signal input path and optical switch test path are substantially aligned.

Claim 24. (Original) A protection arrangement as claimed in claim 23 wherein the first and second columns of mirrors are formed as faces of a deployable prism.

Claim 25. (Previously Presented) A protection switching arrangement for an optical switching system, comprising:

a plurality of input demultiplexers, each said input demultiplexer having at least one input and a plurality of outputs, at least one of said plurality of input demultiplexers forming a spare input demultiplexer; and

at least one first optical protection switch having a plurality of inputs and a plurality of outputs, at least one of said plurality of outputs forming a spare output, said outputs being connected to said inputs of said input demultiplexers and said spare output being connected to the input of said spare input demultiplexer.

Claim 26. (Previously Presented) The protection switching arrangement of claim 25, wherein the first optical protection switch is operable to couple an input associated with a faulty input demultiplexer to the spare output to enable the spare demultiplexer to serve as a backup for the faulty input demultiplexer.

Claim 27. (Previously Presented) The protection switching arrangement of claim 25, further comprising a plurality of second optical protection switches having inputs connected to the outputs of the input demultiplexers.

Claim 28. (Previously Presented) The protection switching arrangement of claim 27, wherein each second optical protection switch has its inputs connected to the outputs of a respective input demultiplexer.

Claim 29. (Previously Presented) The protection switching arrangement of claim 28, further comprising a plurality of optical switching matrices, each said optical switching matrix having a plurality of inputs and a plurality of outputs, at least one of said optical switching matrices forming a spare optical switching matrix.

Claim 30. (Previously Presented) The protection switching arrangement of claim 29, wherein inputs of the optical switching matrices are connected to outputs of the second optical protection switches.

Claim 31. (Previously Presented) The protection switching arrangement of claim 30, wherein each optical switching matrix has one input connected to an output of each of the second optical protection switches.

Claim 32. (Previously Presented) The protection switching arrangement of claim 29, wherein the second optical protection switches are operable to couple an input associated with a faulty optical switching matrix to an output associated with the spare optical switching matrix to enable the spare optical switching matrix to serve as a backup for the faulty optical switching matrix.

Claim 33. (Previously Presented) The protection switching arrangement of claim 29, further comprising a plurality of third optical protection switches having inputs connected to the outputs of the optical switching matrices.

Claim 34. (Previously Presented) The protection switching arrangement of claim 33, wherein each third optical protection switch has its inputs connected to each of the optical switching matrices.

Claim 35. (Previously Presented) The protection switching arrangement of claim 33, further comprising a plurality of multiplexers having inputs connected to outputs of the third optical protection switches.

Claim 36. (Previously Presented) The protection switching arrangement of claim 35, wherein each multiplexer has a plurality of inputs and an output, and wherein each multiplexer has its inputs connected to outputs of a respective third optical protection switches.

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Claim 37. (Previously Presented) The protection switching arrangement of claim 35, further comprising a fourth optical protection switch having inputs connected to outputs of the multiplexers.